Flying the flag for Morse

Morsum Magnificat

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The Morse Magazine

The Pheonix - N1KPR

FRONT COVER
*"The Pheonix" - made by Robert W. Betts, N1KPR. "A plain old
design with in highly polished yellow brass. A pretty key"*

Photo: N1KPR

Comment

Since taking on MM in January this year there seems to have been increasing media interest in MM and Morse. It started with a local BBC Radio station recording a short piece for a morning magazine programme, followed by another on Radio 5 Live. A few days later BBC Midlands TV came for a morning to film the working of MM, including a demonstration of a land-line sounder system and some live CW working on 7 MHz band. This translated into a 6 minute news item about MM which also included some original archive film of a young Marconi giving a demonstration. The next week a further interview took place for a half-hour programme entitled 'Morse Story' to be broadcast on BBC Radio 4 on 3rd June at 11.30pm.

During the making of the latter, I was asked to offer an opinion as to why the media have taken an increasing interest in Morse over the past year. Well – until those interviews took place, I had noticed no such phenomenon, but if the media believe this, it will become a self-fulfilling prophecy!

Some enquiries followed, including a 'new generation' of Morse enthusiasts; the increasing number of people who enjoy active, and sometimes early, retirements, pursuing those interests for which there was never quite enough time earlier in life. MM's e-mailbox is becoming busier these days too – from the young, especially in the USA seeking material for their school projects on Morse. Who said Morse was dead!

What month is it? This is MM, Issue 63 and would normally have 'April' printed on the cover. Considering MM is published in the last week of a month, the one on the cover has been notched up by one to better reflect the date received, particularly overseas. It will now read 'May, July, September, etc. There is NO change in the timing of publication.

Zyg Nilski G3OKD

Contents

Adverts

News

New President of IARU

In voting completed on Friday, March 12, the member-societies of the International Amateur Radio Union, overwhelmingly ratified the election of Larry E. Price, W4RA, as President, and David A. Wardlaw, VK3ADW, as Vice President, for five-year terms beginning May 9, 1999.

Mr. Price was first licensed at age 16 in 1951 and has held elected offices in the American Radio Relay League (ARRL) continuously for the past 27 years, including service as President from 1984 to 1992.

He succeeds Richard L. Baldwin, W1RU, who served as IARU President from 1982. Mr. Wardlaw succeeds Michael J. Owen, VK3KI, who served as Vice President from 1989.

(RAC Bulletin)

RSGB MORSE TEST SERVICE - 13th ANNIVERSARY WEEKEND

Morse test teams will again be on the air during the 13th anniversary weekend of the 8th-9th May. For ease of identification all stations will use a special event GBØ prefix, followed by a county or city suffix. e.g. Norfolk will use GBØNOR and London GBØLDN. The Chief Morse Examiner will use GBØCW and the Deputy Chief Morse Examiner GBØMTS.

There will be 30 different stations active and a Morse Test Service 13th anniversary certificate will be available to any amateur who makes contact with at least 10 of the GB stations. The certificate will be of similar design to the previous awards in order to form a matching set, with a Green and Gold border this year. The cost is £2.50 (cheque or postal order made out to RSGB), $5 or 6 IRC'S. Applications with log extracts only should be sent to the Chief Morse Examiner, David Waterworth, G4HNF, 116 Reading Road, Woodley, Reading, RG5 3 AD. QSL cards are not required to claim the award, which is also available to listeners.

Activity will be concentrated in the 80 and 40 metre bands and in order to encourage newcomers to apply for the award each team will spend some time calling slowly in the Novice CW section of the 80 metre band, above 3560 kHz. The event is not a contest and examiners will be happy to reply at any preferred calling speed. There are no restrictions on the type of Morse key used, all are welcome to call in and enjoy the friendship. The special event stations are:

GBØCW   Chief Morse Examiner
(G4HNF)

GBØMTS	Deputy Chief Morse Examiner (G3RVM)
GBØARM	Co Armagh
GBØATM	Co Antrim
GBØBFD	Bedfordshire
GBØBLY	Burnley, Lanes
GBØBRK	Berkshire
GBØCNL	Cornwall (Poldbu)
GBØDFD	Dyfed
GBØDVN	Devon
GBØDYS	Derbyshire
GBØFMH	Co. Fermanagh
GBØGDD	Gwynedd
GBØGRN	Grampian
GBØHUM	Humberside
GBØHLD	Highland
GBØKNT	Kent
GBØLCN	Lincolnshire
GBØLEC	Leicestershire
GBØLDN	London
GBØLNH	Lancashire
GBØMCH	Manchester
GBØMSY	Merseyside
GBØNOR	Norfolk
GBØPEM	Pembrokeshire
GBØSCD	Strathclyde
GBØSFD	Staffordshire
GBØTAU	Taunton, Somerset
GBØSXE	Sussex East
GBØYSE	Yorkshire East
GBØYSN	Yorkshire North

GW4XXF

The last issue of MM included a colour insert in which Bruce Morris's callsign was was incorrectly printed as G4XXF. This should have been GW4XXF. A poor reward for all the help and material Bruce offered in the preparation of the insert. My apologies - Ed

Radio Officers Association AGM & Exhibition

The 2nd Annual General Meeting of the Radio Officers' Association will take place in Liverpool on Saturday 15th May 1999. The venue is the Atlantic Tower Hotel which forms part of the internationally recognised seafront of this maritime city.

The meeting will occupy the morning and will include an exhibition of an integrated GMDSS communications station by T.S.A. (whose Director is a member of the association), and a display of Morse keys owned by George Robbins.

During the afternoon the delegates and partners will visit the Historic Warships on the East Float, Birkenhead. The Exhibition consists of HMS Plymouth, which saw action throughout the Falklands campaign and HMS Onyx, which was the only non-nuclear submarine to take part in the same conflict. This submarine carried a crew plus twenty men from the SAS and SBS - she was so crowded that she was nicknamed 'The Sardine's Revenge'.

The German submarine U534 is also on display together with the Liverpool Bar Lightship, 'Planet'. Members of the Liverpool Marine Radio and Electronics Society will be on-board 'Planet' to display a selection of 1950's and 60's marine radio communications equipment manufactured by Siemens, AEI, IMRCo and Marconi.

On board HMS Plymouth the RNARS amateur radio station GB2PLY will be active. Since many members of ROA are licensed it is hoped that this station will hold the net frequencies of

3520 and 7020 kHz during the visit and that delegates will be able to get on the air. The AGM Dinner will be held at the Atlantic Tower Hotel on Saturday evening.

The Association was formed in 1995 and has over 180 members. For details on joining the association please contact: John Russell, 21 Landeross Drive Abington Vale, Northampton NN3 3LR.

(John Loughlin, RAO)

New Novice Licence Proposed for South Africa

The South African Radio League (SARL) is proposing a new Novice Licence, to be called the Radio Amateur Learner's Licence. Broadly based on the UK Novice licence, and aimed at the 10-14 year age group, the course will be conducted in a classroom environment and will contain a number of practical projects. These will include construction of a Morse oscillator, an audio amplifier, a simple receiver and a simple CW transmitter.

The intention of the licence is to introduce amateur radio into schools through the classroom and for it to be part of the school curriculum. An educational programme known as Curriculum 2005 aims to introduce "outcomes based" practical teaching into schools to address the shortage of technicians and artisans in South Africa. The proposed Learner's Licence is designed to fit into the Curriculum 2005 programme.

There is still much work to be done. Once approved by SATRA, the telecommunications regulatory body, the education authorities will need to approve the course content. Construction kits will then need to be designed, provided and funded. A Curriculum 2005 pilot scheme is already under way in some 400 primary schools around the country, and it is hoped that the Learner's Licence can be incorporated into that scheme as early as the year 2000.

(Info: IARU Region 1 News, March 1999)

Year 2000 - World Radio Conference

The next ITU World Radio Conference (WRC-2000) will be held in Turkey from 7th May to 2nd June, 2000. It was expected that this conference would review Article S25 of the international radio regulations. It covers the Amateur and Amateur Satellite Services, including the Morse code requirements for operation below 30 MHz. Due to other agenda priorities, however, consideration of these matters will not take place until WRC-2003, or even later.

(From Tony Smith)

RAFARS Slow Morse Net

The Royal Air Force Amateur Radio Society is trying to increase the use of CW. To encourage diffident operators, it now has a QRS (slow Morse) calling frequency, on 3.566 MHz. There is also a QRS net on the same frequency on Thursdays at 1900 hours, local time.

(Info from 'QRV', Journal of the RAFARS, Spring 1999)

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New Canadian Territory – VYØ

The Canadian Territory of *Nunuvut*, VYØ, came into effect on 1 April, 1999. To reflect this new addition, *Nunavut* will become a separate multiplier in the two RAC Contests, commencing with the RAC Canada Day Contest on July 1, 1999.

(Guy Charron, Bulletin Editor, Radio Amateurs of Canada)

GEC makes the Marconi Collection Safe

The unique collection of archive materials and artefacts reflecting the work, life and times of Guglielmo Marconi has been saved for the posterity in an agreement between GEC and the Essex Record Office and Chelmsford Borough Council. This agreement satisfies all the concerns expressed in recent years and will ensure the collection is safe, intact, conserved, displayed and easily accessible to the public.

Sir Roger Hurn, newly appointed Chairman of GEC, said "We are delighted that a solution has been worked out to everyone's benefit. Great credit is due to the County of Essex and the Borough of Chelmsford to help find, at last, an appropriate home for the Marconi archives which meets all the stringent criteria we established originally."

A charitable trust exclusive for the purpose and in accord with advice and guidance from the Museums and Galleries Commission, will be established and the Collection will be transferred from GEC's Technology Centre at Great Baddow, near Chelmsford. The new Essex Record Office now under construction in Chelmsford and due for completion in Spring, 2000, will house the ephemera - predominantly paper-based materials - and the artefacts will be displayed in premises to be identified in due course.

"Chelmsford, more than anywhere else, certainly in the UK, has had the most profound and continuous relationship with Marconi the man, and the Company for most of this century," said Sir Roger. "And, indeed, this is the centenary of Marconi's acquisition of premises in Hall Street, for the world's first radio factory ... Therefore, it is absolutely fitting that the final resting place of the Collection should be established in Chelmsford to the mutual benefit of all".

Some 25 key items from the Collection are currently on loan and on display as part of 'The BBC Experience' in London to celebrate 75 years of broadcasting.

Wanted - Articles, Letters or Pictures on Aviation Morse - Contact MM

RSGB Appoints New Chief Morse Examiner

At the Council meeting on 27th March the RSGB appointed a new Chief Morse Examiner and Deputy. They are David Waterworth, G4HNF and Ian Trusson, G3RVM. The RSGB paid tribute to the work done by their predecessors, "Whilst welcoming David Waterworth, G4HNF and Ian Trusson, G3RVM to the team as Chief Morse Test Examiner and Deputy respectively, the Society recognises the important part played by Roy Clayton and Geoff Pritchard in making the Morse Test Service the efficient organisation it is today."

The Society wishes both Roy and Geoff a peaceful retirement and hopes that they will both continue to enjoy good health and of course CW operation for many years to come"

David Waterworth also commended the achievements of his predecessor , "I am taking over a fully functioning service built up over ten years through the hard work and dedication of Roy Clayton and loyalty of his team". He added, "Roy has been especially helpful during these early weeks in my new role to ensure a smooth hand-over of the service."

Argentinian Clubs Commemorate Historical DX

In commemoration of the 1924 QSO between Carlos Braggio, CB8 from Bernal, near Buenos Aires, with Ivan O'Meara, Z2AC, in Gisborne, New Zeland, Radio Club of Argentina will operate a special event station.

CB8 used the 105 to 125 and 150 to 200 meters bands trying to QSO some ARRL members in USA. Very close to the Buenos Aires sunrise, he and his son were very tired and just when they decided to QRT the CW station, they heard the Z2AC call and signal reports were exchanged.

Carlo Braggio's transmitter was a Hartley auto excited oscillator with 4 Radiotron 203A tubes running about 300 watts. The receiver was a two tube regenerative which is now in the Radio Club of Argentina Museum.

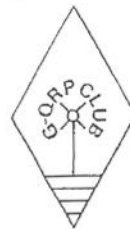The mast was 33 meters high with a very complex 8 wires cage antenna near the River Plate.

Z2AC confirmed the QSO using a Western Telegraph Company telegram, marked '..via Madeira...'

This was one the pioneering QSOs which demonstrated the long range benefits of short waves over the long

wavelengths used by commercial stations at the time.

The Radio Club of Argentina will operate a special prefix station, L75CB, in all bands/modes from 16-23 May. A special award and commemorative QSL card will be sent to all CW QSOs on May 21st.

During the same period GACW will be using a special prefix as follows:

LU will be L2 - (LU1DZ will be L21DZ)
LW will use L3 - (LW8XW = L38XW)
AZ will use L4.

Alberto U. Silva, LU1DZ (GACW)

Product News
Two New Keys Announced

Waters & Stanton , Essex, England have announced two new offerings to their already considerable range of Morse keys. The two new models are additions to their Watson range of keys. The first, a 'straight' key Watson Model W-CRVOT with an audio oscillator built into a wooden base, is particularly aimed at the newcomer to Morse but aims to be equally suitable for serious 'on-the-air' working by easy disconnection of the oscillator.

The second key, Watson Model W-CRIOK is an iambic twin-paddle key with electronic circuits built into a wooden base.

There will be full review of both keys in the next issue of MM. Both keys are hand-crafted, gold plated on brass with ebony knobs and priced at £49.95 and £99.95 respectively from: Waters & Stanton PLC, 22 Main Road, Hockley, Essex SS5 4QS. Tel:+44(0)1702 206835 email:sales@wsplc.demon.co.uk

MM Competition
Win a Watson W-GMC Key

The next issue of MM will include a competition for a Watson key. This hand-made straight key from Minorca is gold-plated on brass, and mounted on a sapele wooden base.

- good to use or display -

The competition will be open to all MM readers.

Look out for the entry form in the next issue. Please remember that if you share a magazine, an extra copy will be required for both readers to enter the competition.

The prize is courtesy of Waters & Stanton PLC.

Do You Visit the
MM Web Page?

The Morsum Magnificat web page has had 23,700 visitors in less than 2½ years, currently upwards of 50 visitors per day. One purpose of the site is to provide the maximum number of links to the world of Morse telegraphy. If you know of any other Morse sites to which links should be provided, please contact the Editor. Ideas and views on what additional services could be provided at the site would be greatly welcomed.

NZART Proposes New Amateur Licence

A Report By Tony Smith G4FAI

Background

Against the wishes of the New Zealand Association of Radio Transmitters (NZART), its national amateur radio society, New Zealand's Administration proposed to the 1995 ITU World Radio Conference (WRC), the abolition of the Morse test required to qualify for amateur radio operation below 30MHz.

The matter was deferred for consideration by a later WRC. Since that time, the International Amateur Radio Union has formulated proposals for a revision of the Radio Regulations covering amateur radio as a whole, not just the Morse requirement, and has concluded there should be no reduction in the minimum qualifications for a license to operate an amateur station. It considers, however, that the actual definition of requirements should no longer be part of the Radio Regulations themselves. Due to the demands of more pressing agenda items, consideration has been further deferred and it is still unclear when the IARU submission will eventually be considered by a WRC.

Much Controversy

Since 1995, controversy has raged around the world over the need for an Amateur Morse test. There has also been much discussion on how the Radio Regulations could be interpreted, with some proponents suggesting that the speed of the 12 words per minute formal test could be reduced to 5 or 8 wpm and still meet the international requirement. Now, NZART (an IARU member), has proposed a new examination system to its Ministry of Commerce that has no formal Morse tests but meets the perceived requirements of the international Radio Regulations for amateur operation below 30 MHz.

The proposed system builds on existing grades of licence and uses the same examinations as before. It retains the privileges of existing licence holders, and is capable of adaptation to existing license systems in other countries.

Meets Both Sides of the Arguement?

It is intended to modify the existing NZ system until such time that a WRC decides to abolish the Morse requirement, but in view of the several deferments already experienced it may be some long time before such a matter is considered at a WRC.

"No-coders" will see the end of the formal Morse test, which they have been

campaigning for, and Morse enthusiasts will see a continuation of the present situation. Some recruits to amateur radio, having had the opportunity to try Morse communication, will take up the mode seriously, thus continuing the present small but significant flow of newcomers which keeps amateur CW alive and well.

Summary of Proposals

- The existing NZ Morse tests of 6 wpm and 12 wpm are eliminated. There is no formal requirement for a Morse test at any speed.
- Existing Regulations and Theory examinations remain unchanged.
- License grade names are changed. Three grades only are recommended, "Entry", "Technician" and "General".
- Existing NZ Novice frequency allocations are retained, but renamed for the Entry Grade.
- Existing two power levels are retained, the lower for Entry Grade and the higher for Technician and General Grades.
- Callsigns are retained permanently after their initial issue, through all grades, unless a voluntary request for change is made. All other features and aspects of ZL calls remain unchanged.
- It is not a progressive licensing system. Direct entry to all grades is possible.

Proposed New Grades, Requirements & Privileges

Entry Grade

Examination requirement

50 percent pass in the Regulations examination. 30 percent pass in the Theory examination.

Privileges

A. Operation in the 144-148 MHz band with all modes at Entry low power level

B. Transmission of Morse code signals at Entry Grade low power level in the band 3525 to 3625 kHz.

C. Operation in the Entry (previously Novice) Grade segments of some HF bands, using all modes and Entry Grade low power level, after obtaining proof of 25 satisfactory Morse code contacts with 25 different stations on 80-metres, and the expiry of 6 months from the first such contact. The additional all-mode frequencies then available would be 3.525 3.625, 21.10-21.20 and 28.10-28.60 MHz.

D. The Entry Grade 6-month and 25-contact requirement is also a credit for the General Grade requirement. A pass in the Entry Grade Regulations examination, requires only a retake of the Theory exam with a 50 percent pass to upgrade to Technician or General Grade as appropriate. See below.

Technician Grade

Examination requirement

50 percent pass in the Regulations examination. 50 percent pass in the Theory examination. (Credit given for a pass in the Regulations Exam for Entry Grade)

Privileges

A. Operation on all amateur bands above 30 MHz with full amateur radio privileges.

B. Transmission of Morse code signals at Entry Grade low power level in the band

3525 to 3625 kHz.

C. After obtaining proof of 25 satisfactory Morse code contacts with 25 different stations on 80-metres, and the expiry of 6 months from the first such contact, a Technician Grade licensee can apply for a General Grade licence to operate with full privileges on all amateur bands. This process can be short-circuited by obtaining a voluntary "Morse Achievement Certificate" of at least 12 wpm to provide faster entry to the General Grade. See details below

General Grade

Examination requirement

50 percent pass in the Regulations examination. 50 percent pass in the Theory examination. (Credit given for a pass in the Technician Grade Exam). Six months on-air experience plus 25 CW contacts on 80-metres, or possession of a 12-wpm voluntary Morse Achievement Certificate.

Privileges:

A. Full amateur radio privileges, i.e. all modes, all bands, full power levels.

Rationale

There is nothing in the international Radio Regulations to say that an Administration itself must carry out Morse testing, nor is any minimum speed of transmission or reception specified.

Morse operating privileges are self-limiting. They can't be exercised without a knowledge of Morse. If there is such knowledge a test is redundant.

The best way to become proficient in Morse, and to understand why some operators enjoy it so much, is to use it on

the air. Listening to Morse tapes is a poor substitute for an inter-active experience.

In this proposal a person must "know the code" before being able to use CW on the air at any speed. The mandatory 25 CW QSOs constitute 25 informal "tests", with experienced CW operators acting as "testers" and providing proof-of-contact QSL cards as evidence that each QSO exhibited adequate communication skills irrespective of the speed used.

As a built-in security factor, the proposal includes provision for the Administration to monitor the performance of the scheme and to require demonstrations of code proficiency from persons qualifying under the 6 months/ 25 QSOs requirement if considered necessary.

At one time, New Zealand amateurs were required to have at least one year's operation on the 80m band with at least 50 CW QSOs (after passing a Morse test) before qualifying for operation on other bands and other modes. The new proposals are for a drastically modified version of the old scheme, cutting the qualifying period and number of QSOs required by half, and abolishing the formal Morse test altogether.

Advantages Claimed

The objective is to produce operators, technicians and communicators with the skills needed for operating in the amateur environment below 30 MHz. On-air experience is valuable training. There is an incentive to improve communication skills. It is active amateur radio involvement.

Eliminating the formal Morse tests removes what are seen as obstacles by

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some candidates, and the need to formally define a Morse test pass-speed and error-rate requirement is removed. Eliminating these tests also removes the need for a formal Morse testing structure, but continues the need for accredited Morse Testers to administer the voluntary "Morse Achievement Certificate".

On-air operating is friendly and informal. The sterile "code-speed error-rate" thinking promoted by formal code tests is replaced by on-air communication effectiveness and experience with the use of code in actual practice. Many operators will become involved in the scheme, sharing in the training and testing of newcomers, creating a completely new community function.

It is suggested that present-day computer training methods for introducing operators to Morse code are such that the first on-air contacts should be of adequate standard for satisfactory first communication.

Voluntary Morse Achievement Certificate

This certificate would have several purposes. It could provide a fast track to the General Licence for anyone wishing to take that route, particularly those with previous experience of Morse in the Armed Forces or in commercial practice.

A 12-wpm certificate would meet the fast track requirement. It would also meet the current requirements of a reciprocal licence which permits amateur radio operation in other countries. At higher speeds the certificate would provide challenge and satisfaction to individuals wishing to demonstrate their proficiency in the code.

It is proposed that existing NZART accredited Morse Testers should test for the certificate which, at the 12-wpm level, would require candidates to send code by hand and receive computer generated code by ear. Certificates will be issued for whatever speeds are attained, and under this system there would be no failed tests.

Present Status of Proposal

The proposal has been discussed with various branches of NZART and with many individual radio amateurs. Support is immense from all grades of licence-holder.

At its meeting on 1st December 1998, the NZART Council gave unanimous support to the proposal apart from one abstention.

The New Zealand Administration, the Ministry of Commerce, has now been asked by NZART to consider the proposal.

(Readers' views will be welcomed on the NZART proposal, particularly on the suggestion that the scheme is capable of adaptation to existing license systems in other countries. All constructive comments received, both for and against the proposed scheme, will be published in MM, but we reserve the right to edit long submissions! Ed.)   **MM**

Wanted - articles and tips on making and restoring keys - contact MM

Early Wireless Telegraphy in the USA

By Ted Jones, G3EUE

A N OPERATOR'S Wireless Telegraph and Telephone Handbook, by V.H. Laughter, Technical Director, American Wireless Institute, Detroit, Michigan, USA, was published in 1909. It outlined various technical aspects of wireless telegraphy theory and practice and stressed the absolute necessity that students should be able to send and receive messages over the wire line by Morse code. If possible, such skill should be mastered before taking up the study of wireless telegraphy because "when one had learned how to send and receive over the Morse instruments one could rest assured of one's ability to send and receive over the wireless set."

As there were many valuable books on the market relating to instruction for wire operators, no further explanation was given regarding actual operating (presumably at this time wireless operators in the USA were using American Morse. Ed).

However, much was made in the book of the difficulties and problems for operators of spark transmitters, particularly their lack of tuning. As a rule of thumb, it suggested, the approximate wavelength of a transmitting station could be determined by multiplying the height of an aerial by a factor of four!

Principal Systems

At that time a number of different systems were in use or under development in the USA and abroad. Among the American systems the best known were those of De Forest, Massie, Fessenden and Stone.
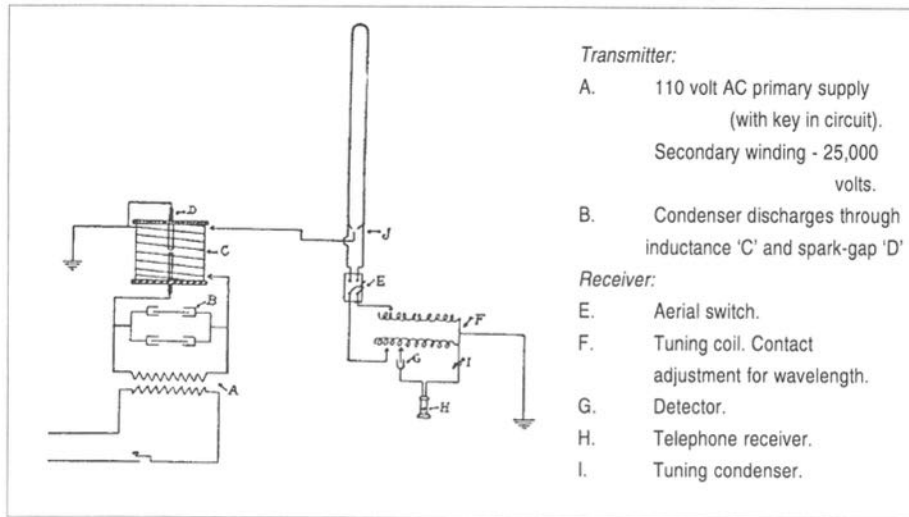
While each employed some special method of connecting up the various circuits, there was, says the book, little difference between them and they were all based on the same general plan. Two common circuits were used, direct or inductively coupled. Direct coupling was broadly used by De Forest, Fessenden and Massie, while the Stone system was inductively coupled.

De Forest System

This was one of the best known American systems, invented by and put into practical use by Dr. Lee De Forest. His instruments were in use in the principal cities of the United States, and were said to be on the

majority of vessels (presumably a reference to American vessels).

Transmitter:

A.   110 volt AC primary supply (with key in circuit). Secondary winding - 25,000 volts.

B.   Condenser discharges through inductance 'C' and spark-gap 'D'

Receiver:

E.   Aerial switch.

F.   Tuning coil. Contact adjustment for wavelength.

G.   Detector.

H.   Telephone receiver.

I.   Tuning condenser.

Circuit of De Forest Wireless Telegraph Set

Stone System

This system embodied a number of unique features, the principal one being that the set was inductively coupled to the aerial. No aerial switch was required because the key automatically broke the circuit when operated. It had one distinct advantage
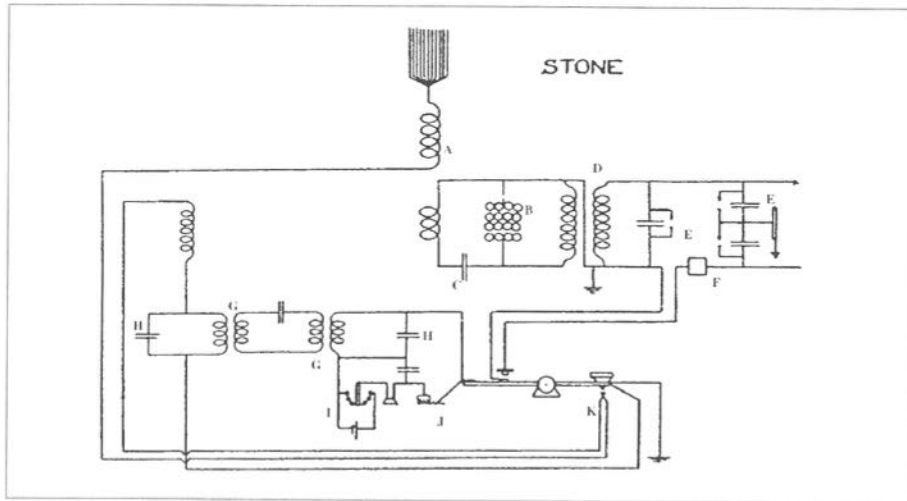
*Complete Sending and Receiving Circuit of the Stone System*

over all others - the operator could be interrupted whilst sending. (Probably the very first example of full 'break-in'. Ed.)

The spark-gap consisted of six brass balls. The condenser 'C' was built up of glass plates coated with tin foil and sealed in beeswax. A difference will be noted between the method of connecting up the spark-gap and condenser in the De Forest and Stone systems. In the De Forest set, the gap is in series with the inductance coil whilst the condensers bridge the transformer secondary terminals. The Stone method was the reverse, with the gap bridging the secondary terminals and the condenser in series with the inductance.

Massie System

This system was invented by Mr. Walter W. Massie of Providence, Rhode Island. It was developed to a high practical stage with a number of sets in government use as well as in long-distance use for private concerns.

Massie also invented the Oscillaphone, a very simple and sensitive detecting device which was widely used by wireless telegraph experimenters. This must have had some limitations, however, because for long distance communication Massie sets
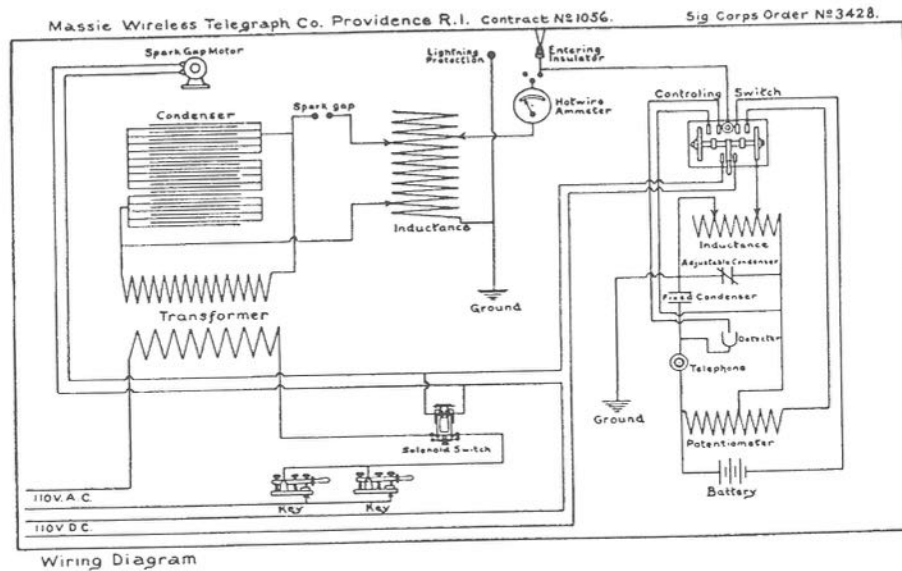

Circuit of Massie Wireless Telegraph Set

were usually equipped with a liquid detector, which was more sensitive and reliable. An additional device was also provided which cooled the spark gap and was said to improve radiation.

The circuit illustrated is in a simplified form. The complete Fessenden set embodies a 'secrecy sender' (it's purpose, and how it was achieved is not specified) and an interference preventer. Both of these could be used with good advantage but with a reduced transmission range. Professor Fessenden perfected a number of instruments including the liquid detector, which was claimed to be the most sensitive detecting device yet used.

Fessenden System
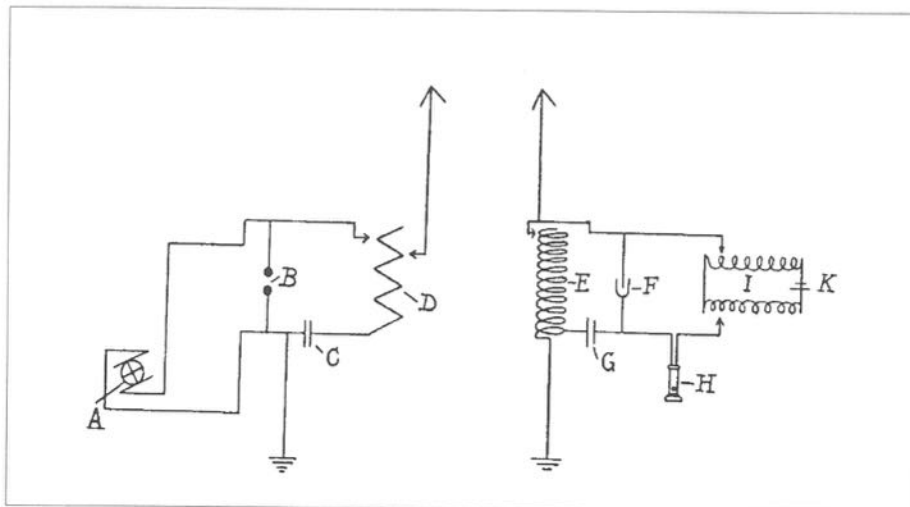
Simplified Fessenden Sending and Receiving Circuit

	Transmitter			Receiver
A	AC generator		E	Tuning coil
B	Spark gap		F	Detector
C	Condenser		G	Condenser
D	Inductance		H	Head phones
			I	Double roller potentiometer
			K	Battery

Rules and Regulations

The following extracts from "Naval Rules and Regulations for Wireless Stations" as listed in the handbook indicate what was expected in, or thought desirable for, ship and shore wireless stations at that time:

- Operating rooms below the water line are decidedly less efficient than those on the upper deck.

- The instruments should be mounted on the table so that they are at safesparking distance from each other and from any part of the operating room.

- The receiving instruments should be as far away from the sending instruments as practicable. The induction coil or transformer may be mounted on the bulkhead or under the table. Connections should be as direct as possible and well insulated by air or other non-conductors. Sharp turns should be avoided on account of brush discharges, as if electricity were travelling too fast to turn corners.

- A sending set working at low power with all connections good, closed and open circuit in resonance, no sparking from the edge of the condenser, jar or plates, nor glow from the aerial and no sparking to the rigging, is utilising its power much more efficiently and will probably be heard farther than the same set pushed to the limit, but out of resonance and with high resistance connections sparking at all points. In any case use only current and gap necessary for good readable signals when sending to stations at known distances.

- The best adjustment for receiving different stations should be recorded or memorized by all operators.

- All contacts should be inspected frequently, particularly the ground connection. The insulation resistance of the aerial should be tested monthly and all insulation aloft inspected frequently. Hard rubber insulators tend to char on the surface.

- Operators must avoid a short or jerky style of sending. Dots and dashes must be firm and of proper relative lengths, as must also the intervals. The spark must kept white and crackling and have considerable volume.

(Ref: Operator's Wireless Telegraph and Telephone Handbook. V. H. Laughter, 1909)
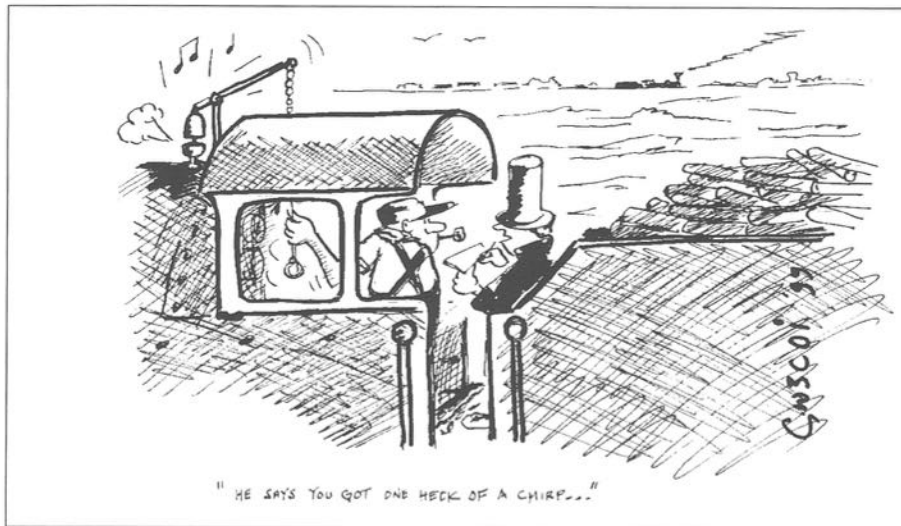
Morse by Steam Whistle

John Packer

There is a story of the inventor, Thomas Edison, whose ingenuity when at Port Huron saved two towns from great inconvenience. The winter had been unusually severe, and towards its close the masses of ice had formed in such bulk and with such tremendous force as to sever the cable between Mount Huron and the Canadian city of Sarnia, rendering the mile and a half of river totally impassable, and impeding all telegraphic communications.

Edison was equal to the opportunity, he commandeered a locomotive engine and whistled again and again on it, in the Morse alphabet, "Hallo, Sarnia; Sarnia do you get what I say?" For a time there was no reply, but at last, from an engine on the other bank came the desired response, clear, cheery, and intelligible. Communication was re-established, and as long as the river remained ice-bound the messages passed through between the cities on the whistles of locomotive engines."

I don't think today's eight bit computer code is capable of the variety of ways of emergency communication available in morse!- J.E.P.

(Researched by John Packer, Hon. Curator, Museum of Submarine Telegraphy – Porthcurno (extract from "All About Electricity" by Gordon Knox. Cassel & Co. July 1914. P27)

" HE SAYS YOU GOT ONE HECK OF A CHIRP..."

Telegraphists' Cramp - Some Early Observations

By E. Geoffrey Walsh, M.D. GM4FH

I AM A PHYSIOLOGIST interested in muscles and their control systems[1] and have been looking up the medical literature on telegraphists' cramp. This, a "trade palsy", prevented telegraphists from continuing in their employment, although if they were fortunate the employer would move them to work requiring a different set of movements such as the writing of messages. The condition was one in which they could not continue to make the required motion. Little, was, and indeed is, known about the underlying reasons for this unfortunate state but often, it seems, muscles pulling in opposite directions (antagonists) contracted at the same time instead of appropriately and rhythmically alternating as required. Treatments were unavailing but a rest from telegraphy for several months might lead to improvement.

I recently came across a carefully written article on this subject in "The Edinburgh Clinical and Pathological Journal" for February 1884. There is a copy in the stores of the library of the Royal College of Surgeons, Nicolson Street. The account is in Volume 1, the only volume ever published, and there is a rather sad little note at the end saying that the journal would not appear the next year!

It is a noteworthy article because of the background of the author, one Thomas Wemyss Fulton. He had been a telegraphist so he knew the operating conditions at first hand. He had studied medicine in Edinburgh, completing the four-year course in 1884 with first class honours, and the article is based on personal knowledge, as he had come across four cases of the condition and had been told of three others.

Fulton was to have a distinguished scientific career becoming Superintendent of Scientific Investigations under the Fishery Board for Scotland and he undertook much experimental work. He became a Fellow of the Royal Society of Edinburgh and died in 1929; there is an obituary in Volume 49 of the Proceedings of that Society. He had published a book of 800 pages in 1911 on "The Sovereignty of the Sea."

Fulton calculated that a telegraphist made between 30,000 and 40,000 contractions per hour (although
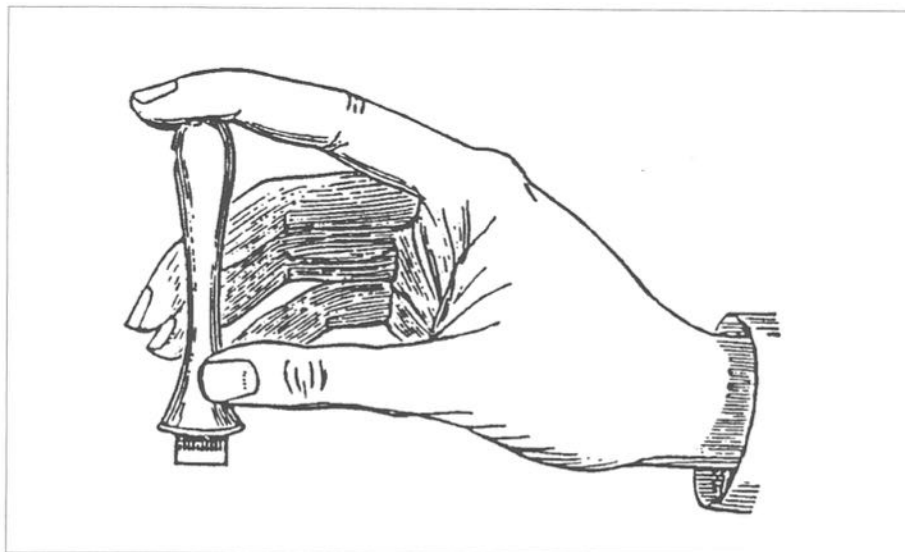
Figure 1. Use of the Wheatstone Perforator to make holes in paper tape.

the basis for these figures, in my opinion, is somewhat questionable)[2]. He wrote of the operator:

"...on busy circuits he may be engaged constantly for nearly eight hours. The limitation of the range of movement; the great number of contractions, their rapidity, difference of duration, and variability of succession, constitute the important and differential features of the Morse manipulation."

With telegraphists' cramp Fulton noted that often:

"...the first thing that attracts the attention of the operator is that he runs together the dashes in such letters as O and J – or, in physiological language, he fails to inhibit the long flexor contraction when there is a succession of them, and has to manipulate with greater slowness and effort".

With submarine cables, because of their great capacitance there was a much more "restricted bandwidth" and signals could not be sent rapidly. Those operators evidently never suffered from cramp.

It is, of course incorrect to believe that in the 19th century telegraphic communication was solely by the use of what we would now call "straight" Morse keys[3]. Some signals were sent by using two levers to control a single needle that moved to the right or the left according to the polarity of the current. The movement was vertical, against a spring, and was about 6.5 mm (¼ inch); it was accomplished by wrist flexion. Fulton calculated that there were on average 179 movements of the left hand and 109 of the right per minute i.e.10,740 & 6,540 per hour. The work load was thus less and in any event was divided between the right and left sides. These operators too

were unaffected.

Finally there was "Wheatstone's Perforator". "The object here is to punch holes in a strip of paper, which, by being run through the automatic transmitter determines the signals. Three discs are depressed vertically, alternately and in succession, by being sharply struck with small mallets, which are held one in each hand as represented in fig 1. The position of the fingers may be somewhat varied. The range of movement, which takes place chiefly at the wrist but partly at the elbow, is something under two inches...The manipulation at this instrument never produces the mal telegraphique..." On average there were per minute 380 movements on the left were made and 300 on the right i.e. 22,800 & 18,000 per hour.

There was an expression "He sends like a Wheatstone", that is, with the precision of an automaton.

The heyday of the telegraph had passed before modern methods of investigating nerves and muscles became available and there has been really nothing to add to knowledge for several generations, we can speculate but may now never know more.

[1] I have written a monograph Muscles, Masses and Motion (1992). MacKeith/Cambridge University Press. ISBN 0 521 43229 4

[2] According to him the average speed of working was 35 words per minute. Is that plausible?

[3] A useful source about telegraphic methods is E.A. Marland's "Early Electrical Communication" (1964). Abelard-Schuman.

Remote Control of W/T Transmission & Reception (RAF &RN)

By Tony Smith
G4FAI

THE AIR MINISTRY Sounder Relaying was used for the remote control of W/T transmission and reception. There were two types: Type A (Ref. No. 5B/117, later designated 10G/117) and Type B (Ref. No. 5B/138, later designated 10G/138). According to the RAF Museum, Hendon, Type 10G/138 was a stock item in RAF stores until "some time after 1959."

The late Len Newnham, G6NZ, told MM that these two types of relay were used in the remote control apparatus for ground stations. He remembered them in use with the transmitter T.70 and more particularly the T.1087.

"Three sounder relays in small glass-topped wooden boxes were used. Two Type A were used for switching low tension and high tension; while a Type B was used for actual keying, this type was slugged with closed metal rings around the coils.

"They were not used as normal sounders for telegraphy, but only as relays. They were polarized and differentially wound. The Type A was operated from the line using a 24 volt supply (12-0-12), while the Type B operated from a 14 volt AC supply through a bridge rectifier. The coils were 500+500 ohms, those in Type A being usually in parallel, and those in the Type B in series.

"As far as I remember, these relays were never used for sounder reception as they were completely encased and the clicks were thus not very loud. Nevertheless, I used to read from the keying sounder when behind the panels of a T.1087, which was very useful when adjusting the keying relay."

Admiralty System

"Modern Telegraph Systems", date and author unknown, describes the Admiralty system for remote control of W/T apparatus, noting that wireless telegraphists in the Whitehall radio transmitting room could control transmitters in practically any part of the British Isles, using two methods of remote control, namely:

Direct Current Keying - Operation of a key at the sending office connecting an earthed battery to line, which in turn operated a telegraph relay at the transmitting terminal station.

The contacts of this relay

opened and closed the circuit of the transmitter, see diagram (a), and -

Tone Keying - Where the audio frequency tone used to modulate the transmitter was generated near the operator's sending position and extended via a two-wire circuit to the transmitter, see diagram (b).

Above - Sounder Relaying Type A, Ref: 10G/117. It comes with a glass topped case.

Right - Sounder Relaying Type B, Ref: 10G/138. Note the slugged coils
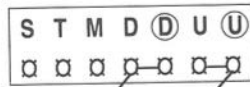
Above - Series and Parallel Connections

Reception

Remote reception was also achieved by use of relays. A typical example was one of the Admiralty's Main Receiving Stations, H.M.S. 'Flowerdown', situated near Winchester, Hants. Here, signals received from overseas were relayed to the Admiralty, London, via land-lines connecting the two establishments. The methods used were:
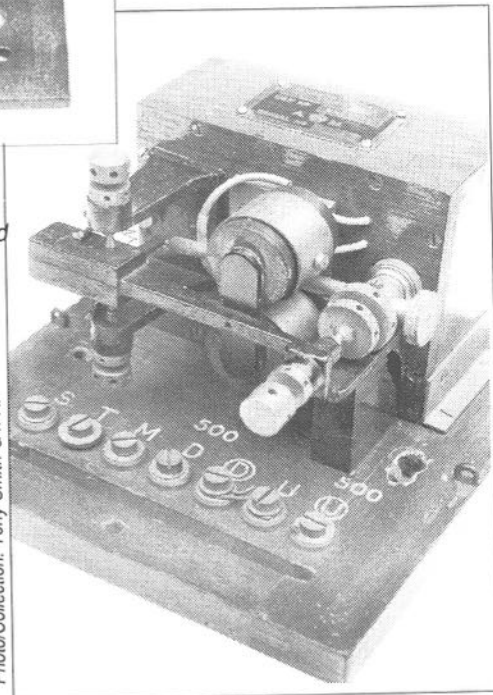
Direct Tone Reception - The audio output of the receiver passed via a two-wire line to the operating position, with line transformers and amplifiers as necessary. See diagram (c).

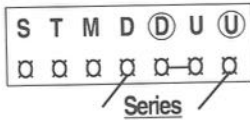*Indirect Tone Reception* - The receiver output was used to

operate a telegraph relay which connected a d.c. potential to the physical line. At the receiving operator's position, line current activated another telegraph relay to operate an audio oscillator and telephone receiver. See diagram (d).

either directly or via a relay. See diagram (e).

The circuits shown illustrate one way communication only, but usually two-way circuits were used, routed via jackfields. If any reader can date these
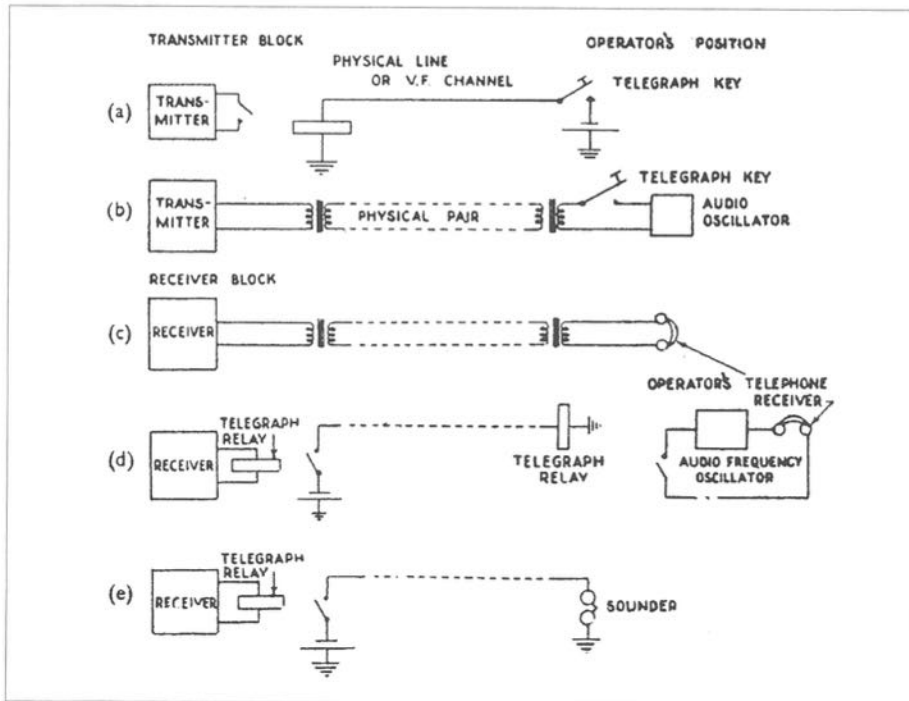
Sounder Reception - The same arrangement as for indirect tone reception, except that at the operator's position the line current operated a sounder or printer

systems, either RAF or RN, or had any experience of them, or can expand on the information given in any way, please contact MM.   *MM*

Showcase
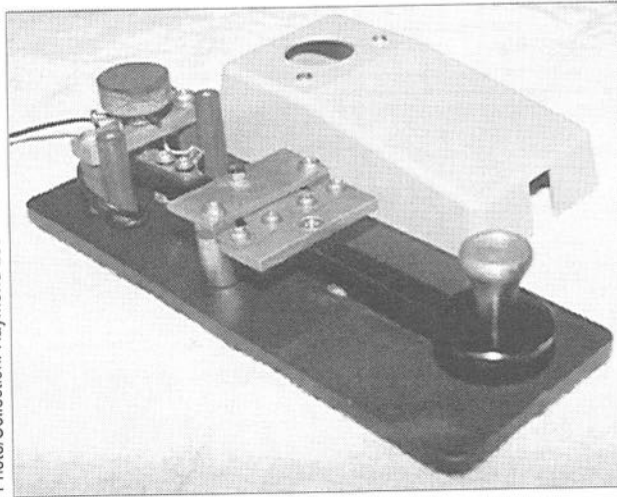
Photo/Collection: Raymond Lee VR2UW

This maritime telegraph key is manufactured by the International Marine Radio Company Limited (ITT Marine) and its model is "Type TK76". Its overall dimensions are 21cm (L) X 7.5cm (W) X 5.5cm (H). The pivot mechanism of this key is similar to the Swedish Lennart Pettersson key. The gap adjuster is in a form of stepped switch. The key arm is insulated from the aluminium knob and skirt. It is unusual to fabricate the knob and disc of metal unless durability is of paramount importance.

French WWI aircraft spark key
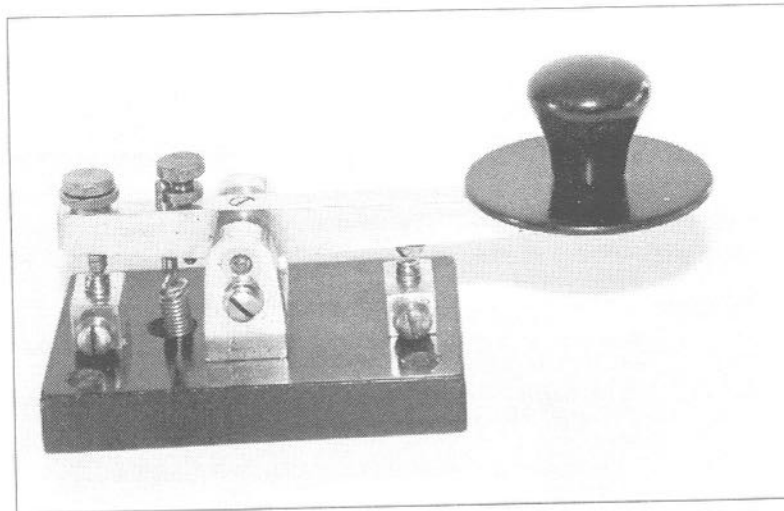
Photo/Collection: Jean Le Galudec
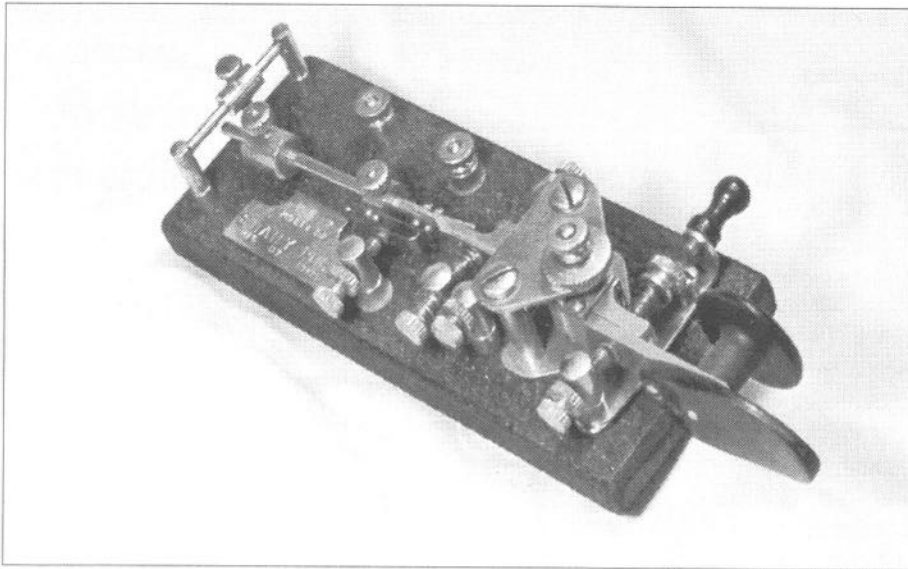
"Baby Bug" made by Robert W. Betts, N1KPR, with many design features reminiscent of old Vibroplex models. Short and narrow.
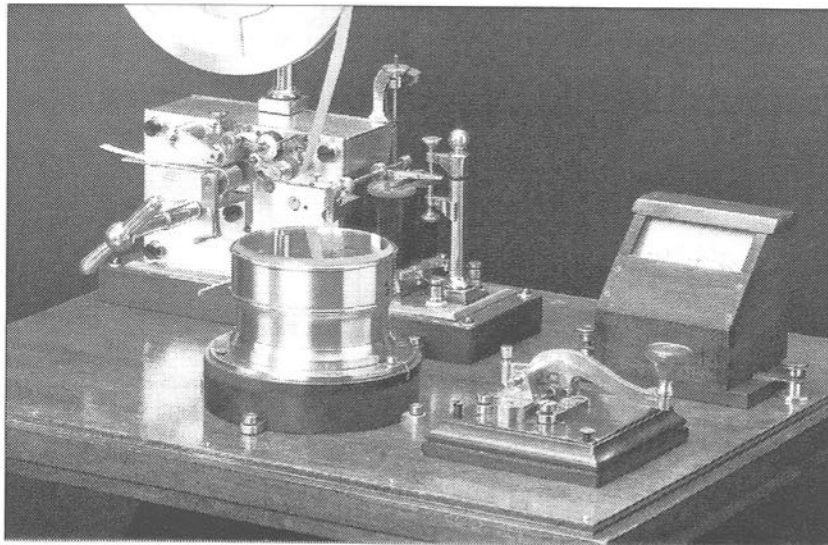
Complete telegraph station as used by Dutch Public Telegraph Services, circa 1859. Ink-writer by Digney Freres, France; camelback key, galvanometer and relay.

Reminiscences of Wellington Telegraph

By Neville Copeland ZL2AKV

THE WELLINGTON Telegraph Office operating room was situated on the first floor of the Chief Post Office in Featherston Street, a site now occupied by the Parkroyal Hotel.

The operating room was the hub with a ground floor counter for receiving telegrams lodged by hand. Also on site was the telephone bureau, the delivery branch, a large 'Mechanician's' workshop and the Telegraph Division which administered the national telegraph network.

Following overseas service in the RNZAF, I entered the telegraph school early in 1946 to convert from oscillator to sounder signals and pass the Murray Multiplex course. Fresh from this environment, I was thrust into the hurly-burly of the Wellington operating room later in the year.

There were a considerable number of hand-operated Morse circuits carrying both press and ordinary traffic. The Morse concentrator terminated about a dozen circuits such as ZLW (the coast station - now closed down - on the Tinakori Hills above Wellington), Parliament Buildings, Wellington Railway, Brooklyn, and other suburban offices.

(A concentrator was a switchboard which enabled a large number of less busy circuits to be connected, as required, to a smaller number of working sets in the Central Office).

The operating tables were of solid oak with cane chairs built up to a comfortable working height. The sounders were in metal boxes on stands close to the operator's ear. There was no 'sidetone' to hear your own sending, only a simple galvanometer to monitor your output signal. The atmosphere in the Telegraph was unique - a real family affair with everyone looking after their fellow operators.

Variety of Keys

Local hostelries were nearby in Grey Street. Old 'Oakey' Kelly was a crackerjack operator who manned the concentrator but could not control his drinking habits. His fellow operators, therefore, managed his pay, bought him shirts and generally looked after him. Other old operators would duck out to the locker room periodically and, if too much under the weather, cajole us newcomers into working on from 9 p.m. to midnight

26
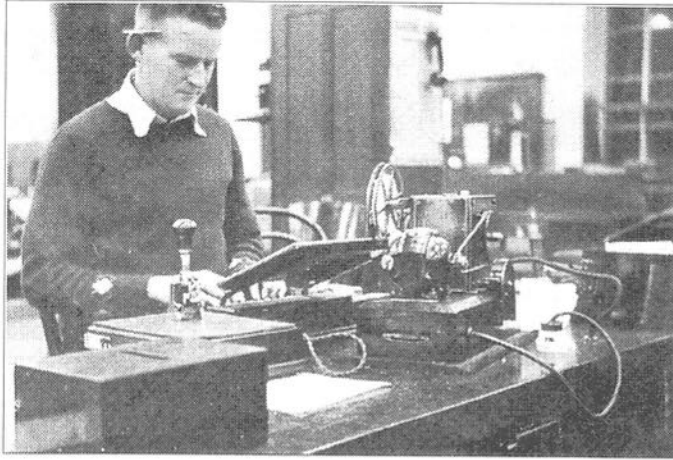
The author at work in Wellinton Telegraph Office

for a pound.

We trainees tended to operate on the quieter circuits in between spells on the Murray circuits to the main centres. As time went on we became more proficient and tried our hand at the concentrator, news traffic from the NZPA to Levin, some 80 miles from Wellington, and other busy lines.

A variety of Morse keys were in use; predominantly Silvertown double current keys on busy circuits and the Standard Post Office pattern Elliott Bros. keys on the quieter circuits. Two pole changers (a type of sounder with contacts to change the battery polarity in the circuit) were still in use on a couple of wires up country.

Symbol of Experience

Just after the war, the New Zealand Press Association had two sub-editors at a table centred in the operating room to generate press releases from cable and

inland reports. The NZPA was later relocated to a room of their own away from the racket, with corresponding increases in staff as the volume of work increased.

Ben Davies, our Superintendent, had a table handy to the Morse wires and would leap out of his chair to chastise luckless operators for misdemeanours. The ZLW daily Ship's List had to be taken down on a typewriter and this is where I cut my teeth taking script directly onto the machine. So many ships at threepence, sixpence, a shilling a word and so on - the list always seemed endless. Later I graduated to Saturday afternoons race results, also taken down on a typewriter.

All telegrams were taken down in pencil, with carbon pencils used for money order and savings bank telegrams. Everyone wore an 'office' coat with dozens of pencils poked in the top pocket. If your coat pocket sported lots of purple you were considered very experienced. Green eye-shades were the vogue for the night shift, and sometimes the night shift outnumbered the day shift on the roster sheet.

Locating Line Breaks

The distributing staff was large in number to keep traffic circulating for transmission and reception, and a central sorting case near the Lamson pneumatic

tubes kept the flow moving.

(The pneumatic air system linked the telegraph operating room with the Counter, the Delivery Branch, Savings Bank, Telephone Bureau and the Cable Room. There had to be periodic checks on the system to prevent any blockages. If jams did occur the technicians used long, linked, bamboo strips to dislodge the offending carrier tube.)

Senior traffic distributors needed a good geographical knowledge of the correct routing for messages. All the day's traffic was 're-checked' late into the evening by a small staff to pick up any unsent, unusual, misnumbered or undebited messages.

When landline faults arose, the Senior Supervisor would use a 'megger' to ascertain if there were breaks in physical Morse lines and instruct the fault man how far along the line the break was. There was one terrible Saturday in February 1947 when a massive storm cut all lines to Wellington Telegraph Office. The only circuit was to ZLW via an American teletype to handle urgent traffic. The same storm demolished the old Rongatai Exhibition Buildings!

Time Signals

Every morning LS (calling all stations - akin to CQ) was sent at three minutes to 9 a.m., sometimes with everyone in the operating room synchronizing their sending so that the tables fairly jumped. The word 'time' was bawled out by a supervisor watching a galvanometer signal sent from the observatory, so when the needle flicked to one side it was spot-on 9 a.m. and all

Post Office doors were opened for business.

Faults on Morse circuits were sometimes prolonged and it was necessary to send continuously ABC, ABC, so that the distant station could change pairs or isolate the fault in some way. There were extensive plug-in resistance sets, variable inductances and other aids to bring a circuit up to operating standard.

Demise of Morse

The majority of the commercial Morse circuits were closed progressively during the 1950's although Morse was still used for order wire traffic at the test board up to the mid-1960's.

The small plug-in set had a large four-pin plug (the same as for a telephonist's head-set in those days) on a short lead to a wooden board containing an Elliott Bros. key and hooded sounder. Along the length of the jack field (divided into bays) were four-pin sockets for plugging in the Morse test set.

Channels on the co-axial cable to distant stations were patched to the test set to prove continuity in readiness for some form of telegraph hook-up - press or commercial wires, etc.

Back-up for Murray Circuits

Several of the old Murray circuits were over physical wires which required re-balancing every time there was a shower of rain up country, much to the consternation of the supervisor in charge of that section.

The 3.30 p.m. 'clean-up' saw a team of 'mechanicians' (later called technicians) descend on the Murray gear to burnish the plateaus (segmented disks)

and renew the brushes that rotated over them. This temporary closedown saw an exodus of the old hands over the road, who sometimes had to be dragged back to their circuits!

Morse contact was maintained with the distant station during the 20-30 minute break, and I can remember many a time taking down urgent 'DBs' (cablegrams) during this period. An operator was always standing by for this duty.

Chess Matches

During the 1950's, telegraphic chess matches were held in late winter each year with either Christchurch or Auckland. I operated the chess circuit for about four successive years from the Wellington Chess Club's rooms at the back of St. John's Church Hall in Upper Dixon Street

The matches would commence at 1 p.m. and continue into the evening. A portable Morse set was used comprising a Post Office pattern Elliott Bros. single current hand key, sounder, P.O. standard relay and a pack of three large 1.5V cells - the same as were used for telephone ringing circuits in those days.

A similar set-up would be installed in the distant chess room and both operators would have about 20 small spike files - for the number of 'tables' in use. Each player used a special alphabetical chess notation to record their moves on paper slips and a messenger brought these to the operator who telegraphed them to the distant chess station. The distant telegraphist passed them on via messenger to the opposite players and then telegraphed back their replies.

The process was slow but sure and

Wellington Telegraph Office in 1948 with me (gummer) and Wally Bruce (perforator).

took around 10 hours. At commencement there was a 'pile-up' of moves to be sent/received until each board settled down to hard slogging. Sending speed was fast at 25 wpm plus. Few errors occurred and if any were found they could be rectified quickly from the spike file copies.

I had a similar experience during the winter of 1973 at Scott Base in Antarctica where my radio technician and I had a long drawn out chess game with the Wellington International Telegraph Office. I forget who actually won this game, but it was exciting at the time!

Cable Traffic

A branch of Cable and Wireless was started up about 1948 in a small corner of the Radio room by a chap called Bill Craig from that company. I served a couple of spells on cable traffic with fast and slow 'homes' to the UK.

In the cable room slow homes were used at a reduced speed to handle general cable traffic. During the rush hours a faster speed (fast) would be used to clear the backlog. This arrangement was in conjunction with other stations on the world-wide cable link). There was a continuous undulator monitoring the incoming signals on four tracks which was very useful if there were blips on the line down from Auckland.

We were all proficient in deciphering the cable code in use, which was in a different format of punched tape to the Wheatstone system with dots above the feed holes and dashes below in alphabetical and numerical combinations. The Cable Room went through three changes of name, from the Overseas Telegraph Branch to the International Telegraph Office.

Impact of Coaxial Links

The Wellington Telegraph testboard was a massive array with all circuits terminated on jack fields. My first experience in this area was at the time when single patch cords were used - later changed to double plugs.

Setting up multiple press circuits was quite an experience and to test the circuits we used a TDMS (Telegraphic Distortion Measuring Set) that conveyed the percentage of error that needed to be corrected in the Carrier Room.

Shortly after the war, the installation of a coaxial link between Auckland and Wellington saw the end of most of the physical pairs, making for much improved and stable circuits. Spurs off this link were laid east and west to both coasts.

Likewise, in 1963, the Compac cable saw the end of of most of the overseas radio circuits which reverted to back-up links in case of cable failure. The radio link via Barbados would tramp along at about 180 wpm when conditions were right, with traffic taken off on Great Northern reperforators and fed into clackety Creed printers, or spooled for re-transmission onto the Auckland Cable room.

High Speed Circuits

I ended my operating career in the International Telegraph Office where we had high speed Morse circuits to Chatham Islands, Noumea, Papeete, Rarotonga, Scott Base, Apia and Niue using

Wheatstone keyboards and Creed Morse senders, with an Elliott Bros. hand key for control. "Z" codes were in use throughout - a throwback to the old Cable Room coding. Each console had push button control of the send circuits to Himatangi and receiving via Makara.

It was back to oscillator tone signals in this Office. If the early operator on a Sunday morning was late in arriving then the supervisor had to man the circuit. Copy was taken on Imperial 66 typewriters in duplicate, with triplicate copies of "BGs" - five letter code groups of government messages.

After some 10 years in this environment, where extensive overseas phototelegram (pix) working was also in operation, I spent the winter of 1973 at Scott Base on the receiving end. Scott Base was the last "inland" office where Morse was used for telegraph traffic since in the following summer season two additional Racal 1 kW transmitters and Olivetti teleprinters were installed using a Unitec telegraph system.

The sad part about the whole affair is that there is no longer any telegraph or cable traffic. Everything is computerized or faxed with direct dialling anywhere in the world. Such is progress and it is not too good to live in the past. However, these few thoughts may rekindle memories among older readers.

(Edited and specially adapted by Tony Smith for MM from a 2-part article which originally appeared in 'Break-In', journal of NZART, New Zealand's national radio society. Neville Copeland recently retired after serving for 16 years as General Secretary of NZART). **MM**

Reader Survey

Thanks again to all readers who replied to the survey. Morsum Magnificat is sent to 35 countries, of which about half the readers are in the UK, 17% in Europe, 20% in N. America and 12% are from the rest of the world. Thirty six percent of subscribers replied to the survey.

Readers

Readers come from a wide variety of occupations, although there are more from engineering. Half have retired, 1% are under 30 years of age and ¼ are in the 30-50 age band. 96% of respondents regard MM as good value for money and 94% save & collect the magazine- definitely a collectors item! Interest in land-line and wireless telegraphy splits 30% / 70% although many of the 30% have an interest in both.

Content & Format

Generally there was great satisfaction with the range of topics, although there was greater demand for more of many topics not balanced out for less of very much. In particular there seemed to be a clear demand for more on history, personal experiences and tips on restoring keys. 90% expressed a preference for the 'little orange magazine' as one respondent put it, and there were no strong feelings over the need for colour.

Overall there was a general opinion that there should be no radical change. Many comments paid tribute to the high quality of work by Tony Smith and Geoff Arnold. There were other very helpful comments too numerous to list here but which have been taken note of.

Ed.

Learning & Improving

Providing Practice Morse

By George Allan GM4HYF

I F YOU PRACTICEMorse the wrong way, you will get into bad habits and the more you do it the worse it will be! In particular, avoid letter-by-letter copying to get a word. Train to copy one word while listening to another! How? - begin by making short recordings of small words and numbers, incorporating all letters or figures.

First Step

Record these mixed numbers - 42 53 64 75 86 97 20 98 31 09 63 52 41 30 74 85 18 87 96 08 29 40 62 51 73 84 07 18 95 76 28 39 50 61 72 83 06 94 17 65 27 38 49 60 71 82 05 93 54 16 81 70 59 48 37 26 04 15 92 43

Replay them a few times for straight listening practice. Listen only, and mentally read each complete 2-digit number as you hear it.

Second Step

Play them again, this time writing down each number one step behind. Write down (copy) one 2-digit number while you are receiving the next one. Avoid catching up, and avoid looking at your copy. By conscious steady attention to receiving and holding the numbers in your head, you will develop an automatic "mental reserve" enabling you to "copy behind".

Example: You receive 42 53 64, etc. You listen to 42 and hold it in your head (ie, in your mental reserve). You receive 53, put it in your reserve, and write down 42. You hear 64, put it in your reserve and write down 53, and so on through the entire recorded list. While doing all this, learning to copy one step behind, develop a steady rhythm as part of the process.

Third Step

Repeat the above steps with 2-letter words, e.g. AT BE OK IS MY TV BY IN AS DO IT UP IF YE GO AN US OR HE WL SO MA PA OX IC WE LA HA OF AH JA OP VI OH QU EH OZ, etc., etc. Listen to AT and hold it. Listen to BE, hold it while you write down AT. Listen to OK, hold it and write down BE,
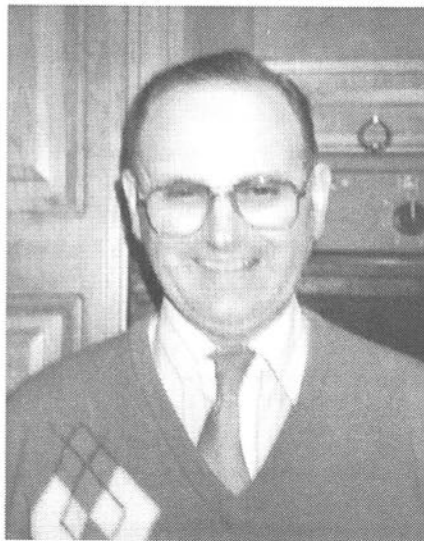
and so on through the list.

Move On

Remember, LISTEN, HOLD, COPY, and a STEADY RHYTHM. When you have mastered the "step behind" habit at this level, move on to 3-figure numbers and 3-letter words. Then to larger numbers and words still to continually improve your receiving skills. Good luck!

Providing Practice Morse

By George Allan GM4HYF

George Allan, GM4HYF - RSGB Co-ordinator for the Slow Morse Service & Secretary to the Morse Enthusiasts Group of Scotland (MEGS)

A COMMON PROBLEM in trying to learn Morse is the lack of suitable 'RECEIVE' practice. For students who do not have the benefit of a qualified instructor one of the main sources of this type of practice in the UK is the RSGB Morse Practice Broadcasts, transmitted on a regular weekly basis by a dedicated band of volunteers. Full details of the transmissions are available from the Society. There are HF broadcasts designed to cover the maximum geographical area of the UK and use is also made of the VHF band to provide a local service for specified areas of the country.

Another source of Morse practice is the 'Library Cassette' service

operated by The Morse Enthusiasts Group Scotland (MEGS). Here are some of the benefits of this system. Each C90 cassette is recorded over its whole 90 minutes with practice Morse at the speed which the student specifies. The tape can be played back at the times which are most suitable without the need to record. The text and/or speed can be up-dated at any time by simply returning the tape or a sending a new one. The quality of the Morse is very high and there is none of the interference associated with 'live' broadcasts. This makes the tapes ideal for anyone aiming for the RSGB Morse tests. For those preparing for these tests, texts are chosen to provide a mix of Plain Language and QSO practice and speeds available range from 3 to 12 Words Per Minute (WPM). When the student reaches test speed the entire tape can be recorded with QSO format throughout it's length, thus in effect producing a wide range of mock Morse tests. This facility is also available at lower speeds. A much broader range of text formats is available at speeds up to 35 WPM and beyond for operators anxious to improve their Receive speed. A phone call is the easiest way to see what would suits best.

There are no charges for this service other than postage and it is available to members and non-members of MEGS. Simply mail a C90 cassette together with a note of the speed and the type of practice required together with a return address label or envelope bearing the correct postage stamps to:-

George M. Allan, 22 Tvnwald Avenue, High Burnside, Rutherglen, Glasgow G 73 4RN. Tel. 0141634 4567

R-Codes & S-Codes Pre-1912 Brevity Codes

By Scott Anderson

B REVITY CODES in telegraphy existed for some time prior to 1908, when the British Post Office, in the absence of internationally recognised codes, issued the codes listed below to be used only by British coastal wireless stations and ships licensed by the Postmaster General. It was noted that the phrases themselves, rather than the codes which signify them, could be used between British ships and colonial or foreign (English-speaking) coast stations. These codes were in effect at the time of the sinking of RMS Titanic in April, 1912 (although there were no distress signals from that ship in which they were used), and were superseded by the first version of the present Q-codes,

set by the International Radiotelegraphic Convention in London, in July of that year. The codes listed are from the 1912 edition of "The Radiotelegraphist's Guide and Logbook", by W.H. Marchant and published by Whittaker & Company of London.(Among other titles published by Whittaker were "Wireless Telegraphy and Hertzian Waves", by S.R. Bottone; "Telegraphy", by T.E. Herbert; "Wireless Telegraphy", by D. Mazzotto). The phrases printed with each code were also listed in French, for use with coast stations or ships with wireless operators using that language:

"In the use of these abbreviations, the signal employed must be repeated three times,

followed by •• — — ••

RA	What station is corresponding?
RB	At what distance are you from my station?
RC	What is your wave length in metres? RD How many words have you to transmit to me?
RE	How are you receiving?
RF	I am receiving badly.
RG	Send me ••• — • twenty times to regulate my apparatus.
RH	Are you being interfered with?
RJ	I am being interfered with.
RK	Atmospherics are very strong.
RL	Tell me the wire charge to...
RM	Engaged with public correspondence. The ship is requested not to interfere.

RN	Stop transmitting.
RQ	Transmit more slowly.
RS	Increase your power.
RT	Diminish your power.
RU	Repeat everything.
RV	from...to... Repeat from such to such a word
RW	from... Repeat ...words from... RX Your turn is No. ...
RY	General call to all stations.
RZ	Nothing more.
SA	I have nothing for you.
SB	Everything in order.
SC	Wait...I will call you as soon as I have finished.
SD	You can transmit faster.
SE	I am occupied with another station.

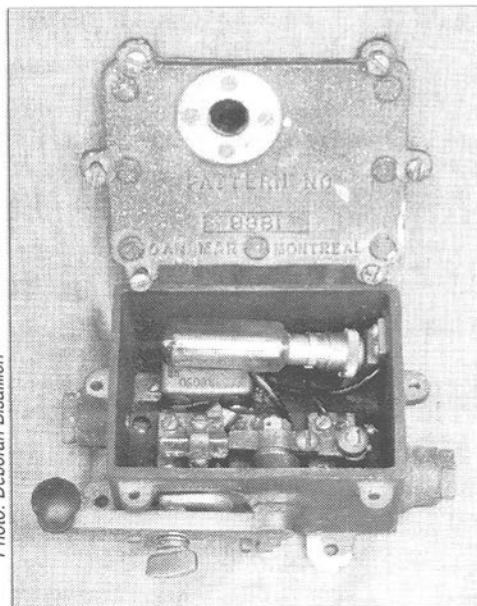If it is found necessary to introduce additional abbreviations they will be continued with the letter S."

Info Please!

Photo: Deborah Bisaillion

Is this a key or does it serve another purpose?
The lever arm control has three positions :
RECEIVING: LOCKS KEY DOWN
OPERATING: ALLOWS KEYING
SAFE : PREVENTS KEYING
It appears to be made by the Canadian Marconi
Co., Montreal, Quebec, although no
information is available from them. It is marked
'Pattern No. 98812' and inside:
' CMC and 19
1937'
There is a blue lens in the lid aperture. The
bulb inside is a Westinghouse 20w, 110v
Patt. No.7911.

Schematic:
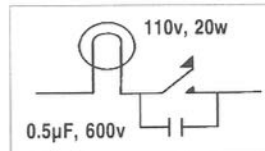
Collection: Chris Bisaillion, VE3CBK

This is a strap key made by H. Tinsley, London. It has '1927' written on the base which is made
of what looks like a mixture of
compressed paper and varnish. The
strap has a cam wheel above. When
the cam is rotated it holds the
contact closed. It's a Type 1202A
and has quite a pleasant action for
sending Morse. But is it a Morse
key? Tinsley's name is generally
associated with test instruments.
Info please.

Photo: Albert Heyes G3ZHE/Collection
Maurice Jeffrey, G7HRN
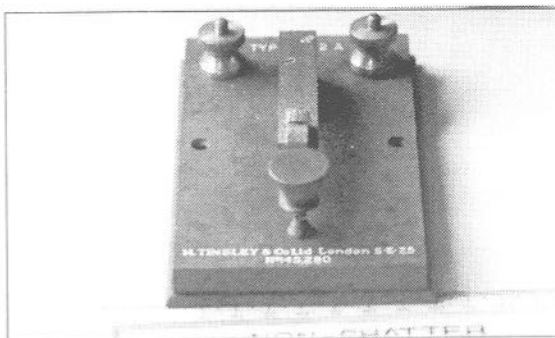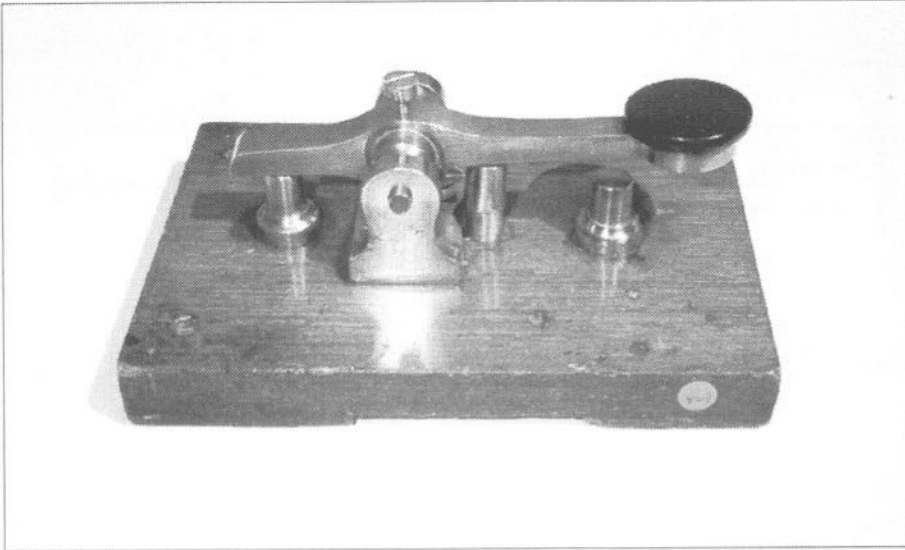
This dummy Key with tension spring inside the cylinder is in the collection of Wyn Davies . Info requested please.

Signal lamp marked PAT.970 1914 around the switch boss. When moved to the middle contact, the switch becomes a miniature Morse strap key with brass knob. The front contact is under the knob. Info requested re: maker, use etc.

I T MIGHT COME as a surprise to many, even to radio amateurs, that still today, in the space age, there is business which depends on the use of Morse code.

Even more surprising is the fact that the business involves most modern airliners equipped with computers, "glass cockpits", GPS, and fly-by-wire controls. Add to that the fact that the price tag for a single airliner can be more than $300 million, and the surprise becomes complete.

Essential to Identify Nav Aids

Morse code is used to identify radio navigation aids. Without them, the air transportation system would be paralysed. The most common nav aids are the VHF Omni-directional Range (VOR), Non-Directional Beacon (NDB), Distance Measuring Equipment (DME) and Instrument Landing System (ILS).

The VOR system, for example, makes flying in clouds between VOR stations as easy as following a highway while DME provides the pilot with instant information on the distance, ground speed and remaining time to destination.

Slow Transmissions

The first step in using any navigation aid is to tune to the proper frequency and positively identify the station by listening to the so-called indicator transmitted in Morse code.

The indicators consist of one, two or three letters/numbers and are transmitted at a very slow rate with generous spacing between each transmission.

The main part of the received signal is displayed on analog or digital instruments, enabling the pilot to maintain direction, rate of descent, landing in low visibility, etc.

No Formal Tests

What degree of code proficiency is required from the pilots? Considering that there are a maximum of three characters at a time to copy, the task is not overwhelming.

The test for the commercial or airline transport licence (conducted by the Federal Transport Department) does not include a code test. That is left to the individual's and the company's discretion.
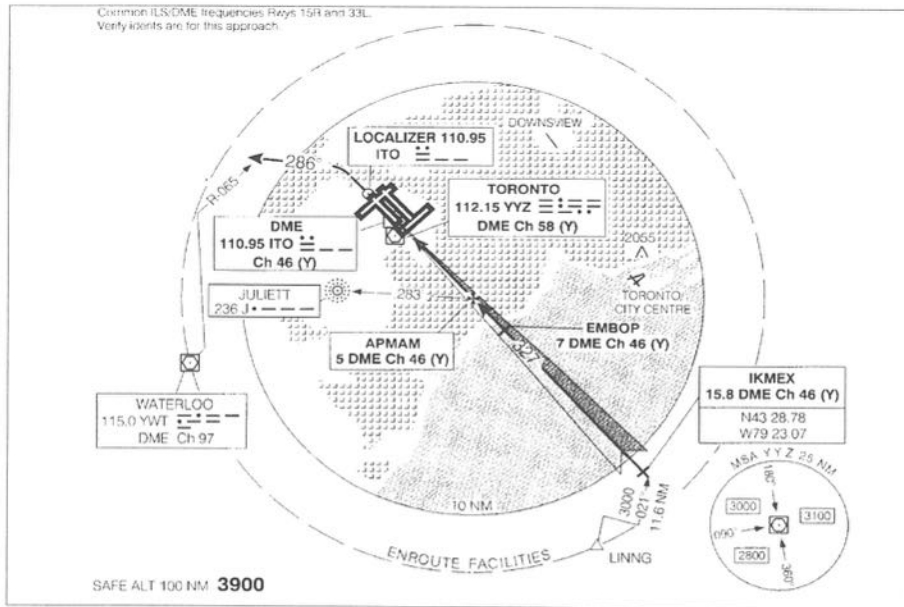
Example of one of the cockpit sheets used by the big jets landing at Lester B. Pearson International Airport, Toronto, Canada. note the use of printed Morse code symbols to assist identification of nav aids.

For example, Air Canada pilots must pass a 6 wpm test. On the other hand, there are companies that don't require any formal proof of proficiency.

Maps include Dots & Dashes

The publications and maps used in the cockpit, in addition to the letters identifying navigation aids, also include dots and dashes for the letters. This goes against the basic idea that the code is based on sound and makes the maps and charts look messy

Is there anything more reliable, foolproof or simpler than Morse code to identify a VOR or NDB? I doubt it!

Next time you are cruising at 35,000 feet, relax. With the help of Morse code, the pilot will deliver you safely to your destination!

(From "The Canadian Amateur" December 1998)

A Key With a History

By Albert Heyes, G3ZHE

THIS KEY BELONGED to Barbara Dunn, G6XL Britain's, and possibly the world's first lady radio amateur. The key is in a fragile state but can be used carefully and belongs to George Fare, G3OGQ who aquired the key and other items following her death. 'World at their fingertips'*, a history of the RSGB describes Barbara Dunn… "Being of a quiet and retiring nature, for a long time few of the hundreds who contacted her efficient and intensively active low power station at Stock in Essex, knew the operator was a lady. Gerald Marcuse (G2NM, President of RSGB 1929-30) did know, however, and it was he who was probably responsible in persuading Miss Dunn to come to the 1930 Convention. A few weeks before, G6YL had been awarded the newly donated 1930 Committee Cup for outstanding work in the first series of 1.7 Mc/s tests. Her presence at the Convention Dinner caused quite a stir as did the fact that when Marcuse made the presentation she became the first lady to become the holder of a Society trophy. Barbara Dunn, who was licensed in 1927, remained Britain's only YL transmitting amateur until 1932 when Nell Corry of Tadworth, Surrey, doubled the number by becoming G2YL."

Note: '*More than thirty years later G6YL and G2YL were still active on the air.*'

*"World at Their Fingertips' by John Clarricoats, G6CL..
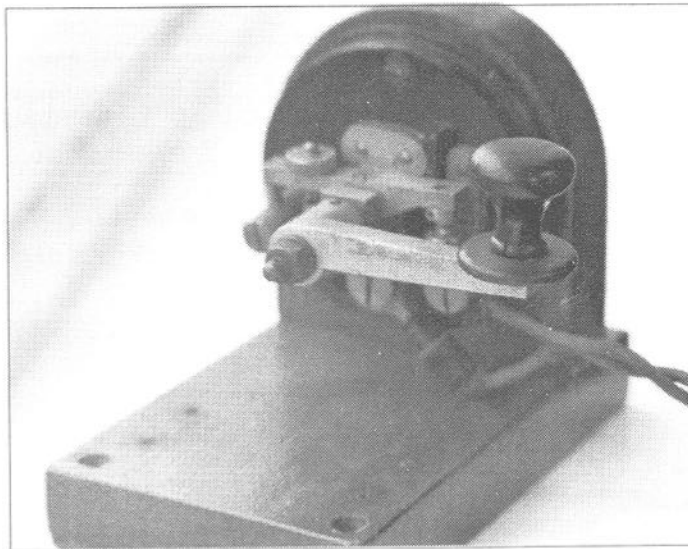Pub: Radio Society of Great Britain.

Photo: Albert Heyes G3ZHE/Collection: George Fare G3OGQ

Book Review

THE VICTORIAN INTERNET by Tom Standage

Reviewed By Ian Brown G3TLH

I must admit to being somewhat sceptical about the title of this book before I read it. Was the author just cashing in on the popularity of anything to do with the Internet?

In fact, Mr Standage has produced a highly readable account of the early development of the telegraph from the earliest optical devices through the first experiments with sending messages over wires to the rapid spread of the telegraph both on land and across oceans. He describes its gradual infiltration into all aspects of nineteenth century social, political, military and commercial life, and its eventual demise through the development of newer technologies for communication.

There are many interesting anecdotes connected with the use and impact of the telegraph. Many of these do not seem to have been brought to light before. The author shows a genuine appreciation of the major part which Morse and his code played in its development. Although this is not a technical book there are well-researched descriptions of some of the major technical developments, for example the use of gutta-percha as an insulating material for undersea cables and the (new to me) way in which the early "stock -tickers" worked.

When I had finished the book I was indeed struck by the remarkable parallels between the early telegraph and the modern-day Internet. They were used for similar purposes; the rapid dissemination of information. There was telegraph crime and telegraph "hackers". Some people became addicted to the telegraph, or at least to the information it provided. Commercial organisations soon realised they would be left behind if they did not adopt it. The old telegraphic destination codes were really a type of e-mail address.

Yes, the author convinced me that there was indeed a "Victorian Internet". I thoroughly recommend this book to readers of MM.

Ian Brown G3TLH

Clubs & Societies

Clubs, Societies and Associations with a special interest in Morse are welcome to introduce themselves on this page

Deutscher Telegrafie Club
A New German CW Club

By Martin Hengemuehle, DL5QE

About a year ago a couple of CW friends founded the Deutscher Telegrafie Club e.V., named DTC or DL-CW-C for short. The club is by its own motto devoted entirely to the continued use of the Morse code in amateur radio. Different from many other CW clubs, DTC feels that the retention of the Morse code exam to get HF amateur licenses is an indispensable requirement. The idea behind this is that the future of amateur radio depends on CW operators who have had some sort of training and proven ability to actually communicate by the Morse code.

While the club has been founded in Germany it is open to everyone in any country who declares to share the club's aims which, besides the retention of Morse code exams, is the proliferation and constant use (which need not be exclusive!) of CW in the amateur radio service.

After its formation the club immediately acted by promoting a PCI, e.g. a Pro Code-Initiative, necessary to counterbalance the already existing No-Code-Initiative. A loosely tied group of CW clubs joined, but expanding the campaign will take more time.

DTC also issues a couple of easy to work CW awards to promote CW activity on the amateur bands without the need to have a top class station at hand or be on the air for long time periods to get an award.

The CWAW (CW Activity Week) run in the first week of May is in the spirit of these awards: easy to take part, almost no stress at all.

DTC also is in constant contact with the German as well as European authorities in PRO for the Morse code in the amateur radio service.

Readers with internet access can get more information about the club at http://www.muenster.org/dtc/eindex.html and everyone else should drop a line to DTC, c/o Thomas Koenig, DG6YFY, Secretary, Rincklakeweg 43, D-48153 Muenster, Germany. The club will be anxious to hear from new members and will answer any mail promptly.

The Chairman of the Club is Martin Hengemuehle, DL5QE, Siemens str. 48 d, D-48153, Muenster, Germany.

Your Letters

My Morse Connection to the World

I've been communicating via Morse code for 17 years, since a brainstem stroke I had when 23 years old left me quadraplegic and unable to speak. At Good Samaritan Hospital in Baltimore, Maryland, where I spent 5 months in rehabilitation, it was discovered that I had some movement in my thumbs, enough to operate pneumatic bulb switches and input Morse code signals. The stroke had no effect on my cognition, and I learned the code quickly with the help of my father, who was a radio operator in the Navy.

At first my switches just emitted different pitches (high – dot / low - dash), and my father translated my transmissions. Then, an engineer friend designed a portable device which translated my Morse code input to letters which appeared on an LED screen. Next Pat Ourand, my speech pathologist connected me to a computer. Through this, I've been able to get a Masters Degree and keep a job as a molecular biologist for the last six years at Aberdeen Proving Ground, reading & reviewing articles for several researchers. I work at home and just connect to base by modem.

For me, Morse code & the computer have been my connection to the world. I feel VERY comfortable with this mode of communication. The switches I use have undergone some modification (I now use mechanical ones), but the basic system is the same with thumb operated switches, one hand for dots, the other for dashes.

I don't think about the specific codes anymore; its just second nature and type about 15 words per minute.

So……..Morse has worked very well for me!

Susan Yim, Maryland

(First published in MORSELS, the News;etter of the Morse 2000 Outreach, University of Wisconsin, promoting Morse code uses in rehabilitation and education)

Key WT Waterproof, (Aust.) No. 1

With reference to Ian Bell's article in MM61, Page 10, my key has the designation Z1/ZAA 7990 KEY W/T (AUST) No1 stamped directly on the metal base (no attached nameplate). It also has the knurled terminals described. The nut on top of the arm for holding the upper contact is much smaller 47mm across the flats.

Peter Lord, VK3FPL

Harold Sydney Bride
2nd Marconi Operator - Titanic

I am currently attempting to organize an international search for whatever information may be available on Harold Sydney Bride, late wireless operator aboard RMS Titanic. Very little definite information exists on this person between the early 1920's and his death in 1956, and in this effort, myself and others are hoping to be able to add to the historical record on this brave man who stayed at his post until within three minutes of the sinking.

For informational purposes, the following is provided in the hope that it may be of use as a connecting link to establish further facts which are presently unknown. (It should be noted that this information is from various sources and has not all been independently verified, which, of course, is part of the object here):

Harold Sydney Bride was born to Arthur and Mary Ann (Rowe) Bride on January 11, 1890 in Hull, England. He had two older brothers—David (born 1882) and Edward (born 1883). The family later moved to Shortlands, Kent, and at the time of the Titanic disaster resided at 58 Ravensbourne Avenue (Arthur Bride died sometime between 1918 and 1922). Harold was engaged to Mabel Ludlow of England on March 16, 1912, but broke off the engagement on September 25, 1912. Bride married Lucy Downie of Scotland (born January 13, 1890), a teacher, on September 25, 1918, and moved to Ayrshire, Scotland in 1922. Three children were born of the marriage, Lucy (born in London) in 1921, John Phillip in 1924, and Jeanette in 1929. He worked as a travelling salesman from 1922, and was known by a niece, Christina, as having been an amateur radio operator. At the time of his death on April 29, 1956, in a hospital in Glasgow, Scotland, Bride's place of residence was listed as Proven Hall Stepps. Lucy Downie Bride died in 1973.

Harold Bride joined the Marconi International Marine Communications Company in the summer of 1911, and served aboard the ships Haverford, Lusitania, Lafranc, Anselm, and Titanic. After the sinking, he worked as a telegrapher in a London post office, then returned to the sea in 1913 as a wireless operator aboard SS Medina. In 1914, he was assigned to a relay station on the coast of Scotland. Leaving the employ of Marconi sometime in 1916, Bride served aboard HMS Mona's Isle, as a net layer, in 1918 and 1919. His last seagoing assignment was as wireless operator on the Cross-Channel Ferry, until 1922.

ANY information that anyone might have will be greatly appreciated, regardless of whether major or trivial, because it could lead to further discoveries. Of particular interest at this point would be information on any family members, living or deceased; who Bride worked for as a salesman, any information on his amateur radio activities, and the location of his burial site (cremation is also a possibility); any other anecdotal information would also be welcomed.

Scott Anderson
Madison, Tennessee

Key - Station Radio A13

I have two keys, of similar design but of different origin and would like to determine whether they have the same use.

Key 1

This is documented by Louis Meulstee in "Unusual Military Morse Keys" AWA Review Vol.8 1993, page 27, it is part of Station Radio A13. The inscription on top reads

KEY TELEGRAPH 5805-99-949-9618

The strap is stamped 5805-99-102-0917, the bottom of the metal mount is date stamped 7 APR 1978, the plug is a Thorn part number 05-0020-10-6P. Contact closure shows continuity between pins C and D.

Key 1 - Detail

Key 2

62GB-16J10-6P 8450. Contact closure also shows continuity between pins C and D. The two plugs are compatible types. Does anyone know whether this key simply a second source for Key 1, or is it for a different radio ? Is there a reason for there being no markings on Key 2? Any information would be greatly appreciated.

Chris Bisaillion, VE3CBK
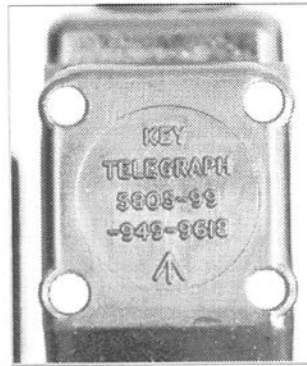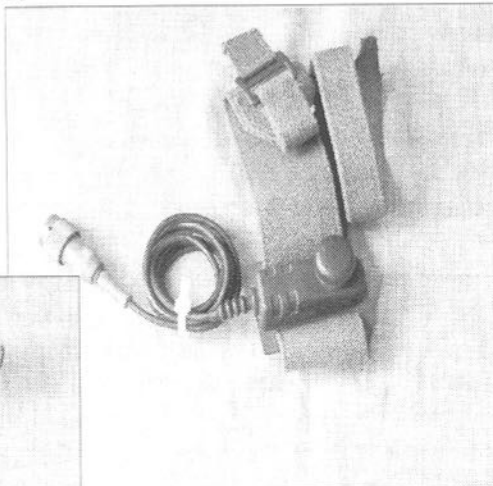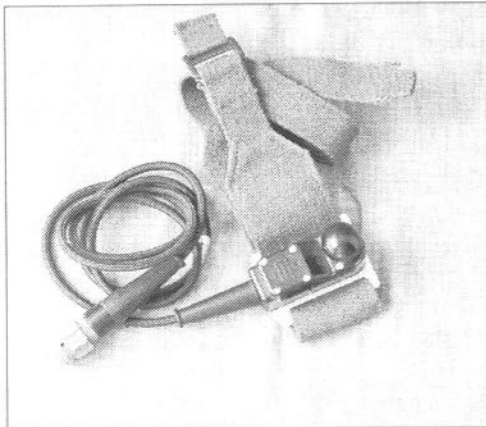
Key 1

Key 2

This is very similar in appearance to Key 1 but has no markings. It is constructed of moulded plastic and rubber and the plug is an Amphenol, part number

Bookshelf

A mail order book service for selected telegraphy titles. The letters *MM* or *RB** followed by a number after each title indicate the magazine and issue in which a review appeared.

The prices quoted for each title are inclusive of postage and packing, the first figure being for despatch to UK addresses, the second for despatch to the rest of Europe by airmail or elsewhere in the world by surface mail. Airmail rates for the rest of the world on request, or if you are using your credit card we can ship by air at your instruction, simply by adding the difference in postal cost to your bill.

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The Phillips Code- a reprint by Ken Miller (MM61) .... £10.00 (UK): £10.20 (Eur/Sur)

Vibroplex Collectors Guide by Tom French .... £15.00 (UK): £15.80 (Eur/Sur)

Wake of the Wirelessman by B. J. Clemons (RB41) .... £12.95(UK): £13.75 (Eur/Sur)

"Q41" and Beyond–The Story of a Wren Telegraphist by Shirley Laws..£5.70 (UK): £6.20 (Eur/Sur)

McElroy: World's Champion Radio Telegrapher by Tom French .... £15.30 (UK): £16.00 (Eur/Sur)

Railroad Telegrapher's Handbook by Tom French .... £8.00 (UK): £8.36 (Eur/Sur)

Bunnell's Last Catalogue with commentary by Tom French .... £5.50(UK): £5.85 (Eur/Sur)

History, Theory & Practice of the Electric Telegraph) .... £13.95 (UK): £14.95 (Eur/Sur)
(Facsimile Reprint of 1866 edition by George B Prescott**)**

Perera's Telegraph Collectors Guide by Tom Perera .... £7.50 (UK): £7.95 (Eur/Sur)

The Victorian Internet by Tom Standage - Hardback .... £16.55 (UK): £17.35 (Eur/Sur)

The Victorian Internet by Tom Standage - Paperback .... £8.30 (UK): £9.20 (Eur/Sur)

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Marconi's Battle for Radio (For the Grandchildren) by Birch & Corfield£6.95 (UK): £6.85 (Eur/Sur)

* RB - Radio Bygones published by G C Arnold Partners

Credit card orders welcome by phone: +44 (0) 1630 638306 or Fax on +44 (0) 1630 638051

MM BACK ISSUE SERVICE

Back issues currently available are Nos. 31, 32, 34–36 and 38–61.
It is planned to reprint as many other back issues as practicable. Each copy is
£2.50 each in the UK and £2.70 to Europe and £2.85 elsewhere, by air-mail.
Deduct 20% from the total price if purchasing 3 or more copies.

FOR SALE

KEYS FOR SALE: Key Telegraph 5805-99-949-9618, with leg strap, £20; RAF Bath tub key (standard key in WW2 bombers), unused, £25; Scribo-Morse Transmitting Plate, c.1920, (plate and stylus only), see MM19, p.19, £40; Junker key (modern), little used, £50; Kent key, hardly used, £30; G4ZPY key (enclosed tension spring), not used, £25. All plus post and packing. Phone write or e-mail for more details. Tony Smith G4FAI, 13 Morley Road, Sheringham, Norfolk, NR26 8JE. Tel: 01263 821936. E-mail: g4fai@connectfree.co.uk

THE MM Q & Z CODEBOOK, a comprehensive 82-page list of the Q-codes and Z-codes, including a one-page list of the original Q-codes of 1912. Available from Dick Kraayveld PA3ALM, Merellaan 209, 3145 EH Maassluis, Holland. Price £5 UK, or US$10.00 outside UK, including postage in both cases. Payment accepted in cash only.

SALE/TRADE: HEAVY-DUTY brass rectangular wireless or spark key made by Signal Electric. Large silver contacts $75. Signal Electric straight key mounted on original lacquered wooden base. Black painted cast iron key base and lacquered brass hardware. Very attractive and complete $50. Early brass oval railroad/landline keys, sounders, or relays: $50 each – many varieties available. Scarce polechanger key $65. Polechanger switch $25. 25 bugs: SASE for list. Dave Pennes WA3LKN; 4607-C Santa Cruz Drive; Indianapolis, IN 46268 – 5354 USA. Phone (317) 471 – 9605.

FOR SALE WITH CIRCUITS and/or complete manual: Marconi Marine Guardian II Trawler Rx type 2354A. Warden II 2182 Rx & Coastcall selcall unit. Kestrel III Trawler Tx/Rx c/w DC PSU. Redifon GR470 Marine VHF Tx/Rx. Bruce Morris, 62 Gerllan, Tywyn, LL36 9DE, Wales, UK.(01654 710741.

18+ PAGE ILLUSTRATED LIST all kinds of telegraph related items surplus to my needs including straight/semi-automatic keys, sounders, relays, KOBs, military items and many miscellaneous items (e.g. WU dolly gram - 1950s'-code learning machines. $3.00 plus equivalent of 4US stamps ($5.00 refund on $25 purchase). Dr. Joseph Jacobs, 5 Yorktown Place, Fort Salonga, NY 11768, USA. Phone: 516-261-1576. Fax: 516-754-4616.

E-mail: joekey@aol.com

FOR SALE continued

BOOKS RELATING TO VARIOUS ASPECTS OF TELECOMMS. – Keys; Landline Telegraphy; Early Wireless; Amateur Radio; Signalling, etc. Send SAE for list: Tony Smith G4FAI, 13 Morley Road, Sheringham, Norfolk NR26 8JE or e-mail: g4fai@connectfree.co.uk

WANTED

WANTED: MARCONI MARINE Alert Rx, Seaguard A/A Rx, Reliance Tx, "Mariner" magazines 1971-end, NSWS & etc. Bruce Morris, 62 Gerllan, Tywyn, LL36 9DE, Wales, UK. Tel: 01654 710741.

WANTED, REMOTE CONTROL Unit 'K' (ZA 46190), enclosed key with leg straps; also 'K' Mk 2 NATO 5820-99-949-1174 gap and tension screws. Mine have snapped off – perhaps you have a Junker key with screws to spare? Please write to Chris Bisaillion, VE3CBK, 1324 Old Carp Road, Kanata, Ontario, Canada, K2K 1X7.

LOCAL HISTORY SOCIETY would like to make contact with anyone who worked at, or has information on, the Morse listening station at "The Old Rectory", Whitchurch, Shropshire, England. Please contact MM.

J H Steward in The Strand

In the early 1950s I would sometimes accompany my father to London on business trips. If time allowed we would always visit J H Steward in The Strand. It was always an exciting shop to visit and at that time they sold surveying instruments, drawing instruments, and slide rules. I don't recall anything relating to telegraphy being on display.

Gerald Stancey
G3MCK

MM Binders

We can now supply MM binders. Each binder holds two years issues of the magazine, secured by wires. Individual copies can be removed if necessary. The binder is covered in a dark red grain material with 'Morsum Magnificat' blocked in gold on the spine.

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See inside front cover for order information

PCH / PA6PCH
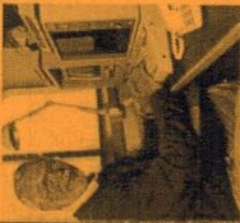
To amateurradiostation: **G4ETQ**

Confirming crossband QSO with PCH20 (4250 kHz)

DD.MM.YY	UTC	FREQ	MODE	RS(T)
20-12-1998	**02:11**	**3525 kHz**	**2xCW**	**599**

Thank you for the QSO and ... farewell from PCH!

Fold Out QSL Card from the PCH Farewell Party for working crossband to their 10 kw maritime transmitter
G4ETQ was very pleased with his QSL cards and wishes to thank all those who were at PCH for putting the station on.

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Bremen	0 8 6	Konigsberg	0 13 6	St. Petersburg	1 11 0
Brussels	0 7 6	Malta	1 11 6	Stockholm	0 18 0
Christiania	0 18 6	Memel	0 13 6	Trieste	0 12 0
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Darlington	Huddersfield	Plymouth	Windsor
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Exeter	Liverpool	Southampton	York.

Lothbury, London, June, 1853.   J. S. FOURDRINIER, Secretary

List of Charges for the Electric Telegraph Company - 1853
(12 pence to the shilling, 20 shillings to the pound)